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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/730,908	12/10/2003	Hirohito Kondo	32739M093	8889

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WASHINGTON, DC 20036

EXAMINER
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AL HASHIMI, SARAH

ART UNIT	PAPER NUMBER
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2853

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12/09/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/730,908	<b>Applicant(s)</b> KONDO ET AL.	
	<b>Examiner</b> Sarah Al-Hashimi	<b>Art Unit</b> 2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 August 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10 and 25-28 is/are pending in the application.
- 4a) Of the above claim(s) 2 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7-10 is/are allowed.
- 6) ☒ Claim(s) 1,3-6 and 25-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                      |                                                                   |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____                                                          | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claim 1,3,4,6,25 are rejected under 35 U.S.C. 102(e) as being anticipated by Nagumo (US 6,603,496).

Naguma teaches:

Claim 1: an LED print head having an LED array formed by a plurality of LED elements which are controlled to emit light in accordance with image data and a drive circuit for driving the plurality of LED elements (fig 7 #3); and  
an LED array controller for driving and controlling the LED print head, wherein the LED array controller includes:

a characteristic data memory for storing a plurality of types of characteristic data regarding each of the plurality of LED elements (fig 7 #1); and

a drive current correction data calculator for reading out the plurality of types of characteristic data from the characteristic data memory, and calculating drive current correction data for each of the plurality of LED elements on a basis of a predetermined equation that includes the plurality of types of characteristic data, as variables (col 11

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lines 42-52—the variables are adjusted by circuitry that would require algorithms which are equation dependent).

Claim 3: one of the plurality of types of characteristic data is light quantity data regarding each of the plurality of LED elements elements (col 10 lines 42-44 “Characteristic A, which is identical to characteristic `a` in FIG. 6, shows the tendency of dot size (black area) to **decrease with decreasing dot density** under normal temperature and humidity conditions”).

Claim 4: one of the plurality of types of characteristic data is data regarding a beam emitted from each of the plurality of LED elements (col 10 lines 42-44 “Characteristic A, which is identical to characteristic `a` in FIG. 6, shows the **tendency of dot size** (black area) to decrease with decreasing dot density under normal temperature and humidity conditions”).

Claim 6: an LED print head having an LED array formed by a plurality of LED elements which are controlled to emit light in accordance with image data and a drive circuit for driving the plurality of LED elements (fig 7 #3); and an LED array controller for driving and controlling the LED print head, wherein the LED array controller includes:  
a characteristic data memory for storing a plurality of types of characteristic data regarding each of the plurality of LED elements (fig 7 #1); and a drive current correction data calculator that, when an LED element to be corrected is defined as a target LED element, reads out a plurality of types of characteristic data regarding the target LED element and a plurality of types of characteristic data regarding each LED element in a predetermined range including the target LED element from the characteristic data

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memory, the predetermined range being shifted as the target LED element shifts, and calculates drive current correction data for the target LED element based on the plurality of types of characteristic data regarding the target LED element and the plurality of types of characteristic data regarding each of the LED elements in the predetermined range including the target LED element, wherein the drive current correction data for the target LED element is calculated based on a predetermined equation that includes the plurality of types of characteristic data as variables (col 11 lines 42-52—the variables are adjusted by circuitry that would require algorithms which are equation dependent).

Claim 25: the plurality of types of characteristic data include light quantity data regarding each of the plurality of LED elements and data regarding a beam emitted from each of the plurality of LED elements (col 10 lines 42-44 “Characteristic A, which is identical to characteristic ‘a’ in FIG. 6, **shows the tendency of dot size (black area) to decrease with decreasing dot density** under normal temperature and humidity conditions”).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 5,26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagumo (US 6,603,496) in view of Lisson (US 5,221,834).

Claim 26: the plurality of types of characteristic data include light quantity data regarding each of the plurality of LED elements (col 10 lines 42-44 “Characteristic A, which is

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identical to characteristic `a` in FIG. 6, shows the tendency of dot size (black area) to **decrease with decreasing dot density** under normal temperature and humidity conditions”).

Claim 27: the plurality of types of characteristic data include data regarding a beam emitted from each of the plurality of LED elements (col 10 lines 42-44 “Characteristic A, which is identical to characteristic `a` in FIG. 6, shows the tendency of **dot size** (black area) to decrease with decreasing dot density under normal temperature and humidity conditions”).

Claim 28: the plurality of types of characteristic data include light quantity data regarding each of the plurality of LED elements, data regarding a beam emitted from each of the plurality of LED elements (col 10 lines 42-44 “Characteristic A, which is identical to characteristic `a` in FIG. 6, shows the tendency of **dot size** (black area) to decrease with decreasing **dot density** under normal temperature and humidity conditions”).

Naguma does not teach but Lisson teaches:

Claim 5: one of the plurality of types of characteristic data is optical resolution data regarding each of the plurality of LED elements (abs lines 19-26).

Claim 26: the plurality of types of characteristic data include optical resolution data regarding each of the plurality of LED elements (abs lines 19-26).

Claim 27: the plurality of types of characteristic data include optical resolution data regarding each of the plurality of LED elements (abs lines 19-26).

Claim 28: optical resolution data regarding each of the plurality of LED elements (abs lines 19-26).

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Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Nagumo to incorporate the plurality of types of characteristic data include optical resolution data regarding each of the plurality of LED elements as taught by Lisson in order to better imaging.

***Allowable Subject Matter***

5. Claims 7-10 are allowed.

6. The following is an examiner's statement of reasons for allowance:

The primary reason for the allowance of claim 7 is the inclusion of the limitation of an image forming apparatus that includes a predetermined equation that includes the plurality of types of characteristic data regarding the target LED element and the range average value regarding the target LED element for each of the plurality of types of characteristic data as variables. It is this limitation found in claim 7, as it is claimed in the combination of, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

The primary reason for the allowance of claim 8 is the inclusion of the limitation of an image forming apparatus that includes the drive current correction data for the target LED is calculated based on a predetermined equation that includes the plurality of types of characteristic data regarding the target LED element and the average value for each of the plurality of types of characteristic data as variables. It is this limitation found in claim 8, as it is claimed in the combination of, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

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The primary reason for the allowance of claim 9 is the inclusion of the limitation of an image forming apparatus that includes the drive current correction data satisfies the following equation:

$$P_n = a_n + a \cdot (b_n - B_{ave}) / B_{ave}$$

where  $P_n$  represents drive current correction data of the n-th LED element,

$a_n$  represents drive current reference data of the n-th LED element for making the light quantity for each of the LED element substantially equal,

$b_n$  represents data regarding a beam of the n-th LED element,

$B_{ave}$  represents an average value of data regarding beams of all of the LED elements

or an average value of data regarding beams of a plurality of LED elements in a

predetermined range including the n-th LED element, and

( $a$  represents an arithmetic coefficient regarding a beam. It is this limitation found in

claim 9, as it is claimed in the combination of, that has not been found, taught or

suggested by the prior art of record which makes these claims allowable over the prior art.

The primary reason for the allowance of claim 10 is the inclusion of the limitation of an

image forming apparatus that includes the drive current correction data satisfies the

following equation:

$$P_n = a_n + a \cdot (b_n - B_{ave}) / B_{ave} + 13 (C_n - C_{ave}) / C_{ave}$$

where  $P_n$  represents drive current correction data of the n-th LED element,



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an represents drive current reference data of the n-th LED element for making the light quantity for each of the LED element substantially equal,

bn represents data regarding a beam of the n-th LED element,

Bave represents an average value of data regarding beams of all of the LED elements

or an average value of data regarding beams of a plurality of LED elements in a

predetermined range including the n-th LED element,

a represents an arithmetic coefficient regarding a beam,

Cn represents resolution data of the n-th LED element,

Cave represents an average value of resolution data of all of LED elements or an

average value of resolution data of a plurality of LED elements in a predetermined

range including the n-th LED element, and

13 represents an arithmetic coefficient regarding resolution. It is this limitation found in claim 10, as it is claimed in the combination of, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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(US 5,270,808) discloses the use of average value with correction data to modify images.

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sarah Al-Hashimi whose telephone number is 571 272 7159. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on 571 272 2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either PAIR or Public PAIR. Status information for unpublished applications is available through PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/SA/

/Manish S. Shah/  
Primary Examiner, Art Unit 2853